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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/570,590	10/26/2006	Nathan J. Wrench	286997US6PCT	9796

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EXAMINER	
BERTHEAUD, PETER JOHN	

ART UNIT	PAPER NUMBER
3746	

NOTIFICATION DATE	DELIVERY MODE
07/26/2010	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No. 10/570,590	Applicant(s) WRENCH ET AL.	
	Examiner PETER J. BERTHEAUD	Art Unit 3746	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 June 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 10-15 and 18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 10-15 and 18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 06 March 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This Office action is in response to amendments filed 6/17/2010. It should be noted that claims 10, 11, 14, and 15 have been amended and claims 1-9 and 16-17 have been cancelled.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 10-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mount 6,568,926 in view of Jorgensen 4,336,000.

Mount discloses, regarding claim 10, a pump assembly comprising: a piston 39; a cylinder (see 37, 47); and an actuator 37 for moving the piston 39 axially in the cylinder, a manifold 11, and a low friction dish-shaped seal 42 having a peripheral portion (see 46) forming a seal between the cylinder and the manifold 11 in a fully extended position of the piston (see 42 in Fig. 1), said dish-shaped seal 42 further having a top portion 43 attached to the piston 39 and moving with the piston such that said top portion 43 of the seal 42 is compressed against the manifold 11 in said fully extended position of the piston (see position of piston 39 in Fig. 1). However, Mount does not teach the following actuator and dosing limitations taught by Jorgensen.

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Jorgensen teaches, further regarding claim 10, a pump comprising: a piston 24; a cylinder 23; and an actuator (56) for moving the piston 24 axially in the cylinder 23, wherein the actuator is a high resolution linear actuator (see col. 7, lines 37-43).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to have modified the assembly of Mount by implementing a piston driven by a high resolution linear actuator, as taught by Jorgensen, in order to more accurately dispense the working fluid.

Re claim 11, Mount teaches that said manifold 11 has at least one inlet 19 and one outlet check valve 30 that are passive, one-way valves.

Re claim 12, Jorgensen teaches that said pump is a syringe pump of which the piston 24 contacts a solid surface at an end of each dose cycle.

Re claim 13, Jorgensen teaches the linear actuator is driven by a rotary electric motor 54 through a gear reduction (see 55).

Re claims 14 and 15, Jorgensen teaches that the pump has a capacity equal to a maximum dose so that a required additive volume is always dispensed through only one cycle of the pump; wherein said pump has a capacity lower than a maximum dose so that a required additive volume is dispensed through one or more pump cycles (see col. 5, lines 29-32 and col. 6, lines 43-48). The pump in Jorgensen is capable of dispensing various amounts of fluid and therefore the combination is capable of dispensing a maximum, or less than maximum, amount of fluid.

4. Claims 10-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jorgensen 4,336,000 in view of Mount 6,568,926.

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Jorgensen discloses, regarding claim 10, a pump comprising: a piston 24; a cylinder 23; and an actuator (56) for moving the piston 24 axially in the cylinder 23, wherein the actuator is a high resolution linear actuator (see col. 7, lines 37-43).

However, Jorgensen does not teach the following seal limitations taught by Mount

Mount teaches, further regarding claim 10, a pump assembly comprising: a piston 39; a cylinder (see 37, 47); and an actuator 37 for moving the piston 39 axially in the cylinder, a manifold 11, and a low friction dish-shaped seal 42 having a peripheral portion (see 46) forming a seal between the cylinder and the manifold 11 in a fully extended position of the piston (see 42 in Fig. 1), said dish-shaped seal 42 further having a top portion 43 attached to the piston 39 and moving with the piston such that said top portion 43 of the seal 42 is compressed against the manifold 11 in said fully extended position of the piston (see position of piston 39 in Fig. 1).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to have modified the assembly of Jorgensen by implementing a dish-shaped seal onto the piston that is compressed against the pump manifold when the piston is fully extended, as taught by Mount, in order to create a better seal between the piston and the cylinder and to fully evacuate the pump chamber with each stroke.

Re claim 11, Mount teaches that said manifold 11 has at least one inlet 19 and one outlet check valve 30 that are passive, one-way valves.

Re claim 12, Jorgensen teaches that said pump is a syringe pump of which the piston 24 contacts a solid surface at an end of each dose cycle.

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Re claim 13, Jorgensen teaches the linear actuator is driven by a rotary electric motor 54 through a gear reduction (see 55).

Re claims 14 and 15, Jorgensen teaches that the pump has a capacity equal to a maximum dose so that a required additive volume is always dispensed through only one cycle of the pump; wherein said pump has a capacity lower than a maximum dose so that a required additive volume is dispensed through one or more pump cycles (see col. 5, lines 29-32 and col. 6, lines 43-48). The pump in Jorgensen is capable of dispensing various amounts of fluid and therefore the combination is capable of dispensing a maximum, or less than maximum, amount of fluid.

5. Claims 10, 14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lemaire 5,421,295 in view of Jorgensen 4,336,000, and in further view of Mount 6,568,926. This is an alternate rejection to the ones made above.

Lemaire discloses, regarding claim 10, a fuel system for a heavy fuel engine comprising a liquid fuel additive dosing pump comprising a piston (see abstract). However, Lemaire does not teach the following pump structure taught by Jorgensen and Mount.

Jorgensen teaches, further regarding claim 10, a pump comprising: a piston 24; a cylinder 23; and an actuator (56) for moving the piston 24 axially in the cylinder 23, wherein the actuator is a high resolution linear actuator (see col. 7, lines 37-43). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to have modified the assembly of Lemaire by implementing a piston driven by

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a high resolution linear actuator, as taught by Jorgensen, in order to more accurately dispense the working fluid.

Lemaire in view of Jorgensen discloses the invention as discussed above. However, Lemaire in view of Jorgensen does not teach the following seal limitations taught by Mount.

Mount teaches, still further regarding claim 10, a pump assembly comprising: a piston 39; a cylinder (see 37, 47); and an actuator 37 for moving the piston 39 axially in the cylinder, a manifold 11, and a low friction dish-shaped seal 42 having a peripheral portion (see 46) forming a seal between the cylinder and the manifold 11 in a fully extended position of the piston (see 42 in Fig. 1), said dish-shaped seal 42 further having a top portion 43 attached to the piston 39 and moving with the piston such that said top portion 43 of the seal 42 is compressed against the manifold 11 in said fully extended position of the piston (see position of piston 39 in Fig. 1). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to have modified the assembly of Lemaire in view of Jorgensen by implementing a dish-shaped seal onto the piston that is compressed against the pump manifold when the piston is fully extended, as taught by Mount, in order to create a better seal between the piston and the cylinder and to fully evacuate the pump chamber with each stroke.

Regarding claims 14-15, Lemaire, as modified, teaches that a heavy fuel engine defines a maximum dose of additive for optimal conditions and said pump has a capacity equal to a said maximum dose so that a required additive volume is always dispensed through only one cycle of the pump; and wherein a heavy fuel engine defines

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a maximum dose of additive for optimal conditions and said pump has a capacity lower than a said maximum dose so that a required additive volume is dispensed through one or more pump cycles (see Jorgensen, col. 5, lines 29-32 and col. 6, lines 43-48). The pump in Jorgensen is capable of dispensing various amounts of fluid and therefore the combination is capable of dispensing a maximum, or less than maximum, amount of additive.

6. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lemaire 5,421,295 in view of Jorgensen 4,336,000, and in further view of Mount 6,568,926.

Lemaire discloses a fuel system comprising a liquid fuel additive dosing pump comprising a piston (see abstract). However, Lemaire does not teach the following pump structure taught by Jorgensen and Mount.

Jorgensen teaches a pump comprising: a piston 24; a cylinder 23; and an actuator (56) for moving the piston 24 axially in the cylinder 23, wherein the actuator is a high resolution linear actuator (see col. 7, lines 37-43). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to have modified the assembly of Lemaire by implementing a piston driven by a high resolution linear actuator, as taught by Jorgensen, in order to more accurately dispense the working fluid.

Lemaire in view of Jorgensen discloses the invention as discussed above. However, Lemaire in view of Jorgensen does not teach the following seal limitations taught by Mount.

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Mount teaches a pump assembly comprising: a piston 39; a cylinder (see 37, 47); and an actuator 37 for moving the piston 39 axially in the cylinder, a manifold 11, and a low friction dish-shaped seal 42 having a peripheral portion (see 46) forming a seal between the cylinder and the manifold 11 in a fully extended position of the piston (see 42 in Fig. 1), said dish-shaped seal 42 further having a top portion 43 attached to the piston 39 and moving with the piston such that said top portion 43 of the seal 42 is compressed against the manifold 11 in said fully extended position of the piston (see position of piston 39 in Fig. 1). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to have modified the assembly of Lemaire in view of Jorgensen by implementing a dish-shaped seal onto the piston that is compressed against the pump manifold when the piston is fully extended, as taught by Mount, in order to create a better seal between the piston and the cylinder and to fully evacuate the pump chamber with each stroke.

Response to Arguments

7. Applicant's arguments with respect to claims 10-15 and 18 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

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§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to PETER J. BERTHEAUD whose telephone number is (571)272-3476. The examiner can normally be reached on M-F 9am - 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Devon Kramer can be reached on (571) 272-7118. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Devon C Kramer/
Supervisory Patent Examiner, Art
Unit 3746

PJB
/Peter J Bertheaud/
Examiner, Art Unit 3746